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future use as of value in this State. Among these, however, are some very promising varieties. This necessitates, besides work in the field, much chemical work, analyses of juices, etc.

5. It is also proposed to enter upon another line of work with our pasture and meadow grasses,—the selection, preservation, and propagation in absolute purity, by sod-culture and seed, of the most vigorous and hardy strains and individuals of the most valuable varieties. It is hoped to establish the better types as standard by co-operation with some other stations, and to supplant the degenerate varieties so largely used.

Maps, charts, plans, and drawings for purposes of illustration of station work, have also been made.

In the chemical department the following work is in hand: 1. Analysis of milk of registered cows undergoing experiment (this work involves at present the complete analyses, each week, of from ten to fourteen samples of milk, and the extent of the work will increase until the whole herd is in milk); 2. Analysis of skim milk, buttermilk, and butter, in connection with the foregoing, requiring at present from fifteen to twenty-one analyses each week; 3. An extended investigation into various methods of creaming, requiring at present seven analyses each week, but soon the work will be increased threefold; 4. Analyses of all the feeding-stuffs connected with various experiments being carried on at the station; 5. Analysis of fertilizers in accordance with the recent law establishing a fertilizer-control at the station; 6. An investigation into the influence of acidity of cream upon the quantity and quality of butter produced; 7. Experiments relating to a more accurate method for the determination of fat in feeding-stuffs; 8. Experiments relating to a simple method for the determination of nitrogen in nitrates; 9. Analysis of various things sent to the laboratory from different parts of the State.

The work being carried on in the horticultural department is a continuation of that of last season, with the addition of such other lines as have been thought best. The leading features are (1) tests of the novelties in vegetables as to their desirability and commercial value; (2) tests of vegetable seeds, especially cauliflower and cabbage, to ascertain the value of American-grown seed as compared with imported seed; (3) the acclimatization of vegetables not native to this climate, notably the sweet-potato, with which very successful results have been obtained; (4) the forcing, under glass, of such vegetables as seem best adapted for that purpose; (5) tests of varieties of small-fruits, which consist in the study of the varieties as to their commercial value and adaptability to the climate of this State; (6) also, so far as facilities offer, work in cross-fertilization, tending to the improvement of varieties and the special study of pollen influence. This line of work is of very great value, and a large part of the greenhouse has been set apart for the continuation of it through this coming winter, as there are, from the results of last winter's crossing, over one thousand seedlings to be tested; and the data, if as valuable as expected, should be before the public as soon as possible.

The above is in connection with the daily routine of note taking, and records made of the planting, germination, growth, habit, blossoming and fruiting season, of all plants in this department, a large number of which notes are merely for reference, and are only inserted in our record books, making no showing that would lead the public to know what a vast amount of constant painstaking work is necessary to keep records that become of greater value year by year.

In the pomological department the testing of the large fruits and of the varieties of grapes is being carried on as heretofore, and a study made of their habits of growth, vigor, susceptibility to disease, hardiness, and adaptability to this climate; also of the diseases affecting the different fruits, especially the grape. Experiments are being continued with fungicides and insecticides, with the object of obtaining simple and effective remedies for the holding in check or entirely ridding our orchards and vineyards both of fungi and the insect pests that are rendering such a large proportion of our fruit worthless. A more extended line of experiments is being planned for the coming year, intended to embrace a larger field; and some of them will be carried outside the station limits through the courtesy of nurserymen and fruit-

growers, a number of whom have offered to place the necessary land and stock at the disposal of the station. It is intended that a portion of this work shall be devoted to experiments with fertilizers. In connection with this, an object-lesson in the chemical composition of the ash of four leading fruits (apple, pear, plum, and cherry) and of two of the woods (grape and apple) has been prepared, showing the amounts of the different fertilizing and mineral elements removed from the soil by the growth of 150 pounds of each of the fruits named, also by 100 pounds of the wood of the grape and apple. It is intended for use at the fairs, farmers' clubs, and meetings of fruit-growers, and for use at the station.

As a portion of the general farm-work has been included in this department, a considerable amount of routine work has necessarily to be performed. Experiments have also been started with cereals and grasses, to test varieties and methods of seeding. Others are planned with fertilizers, ensilage, crops for soiling, and methods to obtain the best and most economical results.

In addition to the above regular and systematic work of investigation going on at the station, there have been published during the past year, in addition to an annual report of several hundred pages, seven bulletins with an aggregate of 173 pages, 45,000 copies of which, in all, have been distributed among the farmers of the State; while the correspondence has steadily and rapidly increased from a total of less than 500 letters in 1887, to over 2,000 during the past year, many of these letters of inquiry necessitating study and investigation.

NOTES AND NEWS.

THERE are few injurious insects for which more remedies and preventives have been recommended than for the striped cucumber beetle,—the everywhere abundant yellow "bug" with black stripes along its back, which attacks squashes, cucumbers, melons, and in fact nearly all cucurbitaceous plants. A large portion of these remedies are doubtless worthless, if indeed not positively injurious. In order to get a more definite knowledge of the preventive or remedial value of these various substances, the Ohio Experiment Station began last season a series of experiments in which it is designed to give each a practical field test, and, if possible, to arrive at some reliable conclusions for the guidance of the interested public. The results of last year's work showed that many of the so-called remedies are worthless, some even being worse than the disease. The experiments were continued this year on an extensive scale. A field of two acres was put in good condition by the use of plough and harrow, and was planted to squashes, melons, and cucumbers according to the ordinary plan of growing these vegetables. The seeds came up early in June, and the first striped beetles appeared soon after. They then came in great numbers, and destroyed a large number of plants before they could be treated. Two general methods of treatment were employed: (1) coating the plants with poisonous substances, and (2) fencing out the insects by mechanical barriers. The best success was attained in the first class of remedies by the use of tobacco-powder,—the refuse packing of the cigar-factories. A number of barrels of this substance were obtained at a cigar-factory. A shovelful of the powder was thrown on each hill. The first application was made to eighty hills, June 12. Rains coming soon after, it was repeated June 14, 16, and 17. The results were excellent. The beetles seemed to dislike working in the tobacco, and the plants on all the hills so treated came through in good condition. Aside from its value as an insecticide, the tobacco acts both as a mulch and fertilizer. Chemical analysis shows that its value as a fertilizer is twenty five dollars per ton. In many Eastern cities it is being utilized, but in Columbus and other Ohio cities many of the factories are glad to give this refuse to any one who will take it away. Various methods of mechanical exclusion of the beetles were again tried with good success. This may be done by simply placing over the plants a piece of thin plant-cloth or cheese-cloth about two feet square, and fastening the edges down by loose earth. It is better, however, to hold the centre of the cloth up by means of a half barrel-hoop, or wires bent in the form of a croquet arch. It is frequently stated that

these beetles will not attack plants if simple frames, consisting of four pieces of boards nailed together, without a top of any kind, are placed over the hills. This method was tried with a number of frames ranging from four to ten inches in height. As anticipated, the method was entirely unsuccessful, every plant of the hills so covered being destroyed by the beetles.

— The next meeting of the American branch of the Society for Psychical Research will be held at the rooms of the Boston Society of Natural History, corner of Berkeley and Boylston Streets, on Tuesday, Dec. 2, at 8 P.M. The secretary will give an account of some cases recently received or investigated, and make a report of some sittings with Mrs. Piper in England, by Professor Oliver Lodge, F.R.S. No admittance except by ticket, which may be obtained by members or associates on application to the secretary, Richard Hodgson, 5 Boylston Place, Boston, Mass.

— The new building for the Philadelphia Polyclinic and College for Graduates in Medicine will be ready Jan. 1, 1891, and will provide accommodations for the Polyclinic, or college departments, the Polyclinic Hospital, the Ladies' Aid Society of the Polyclinic Hospital, the Polyclinic Medical Society, and the Polyclinic Medical Library. Since 1882 post-graduate medical schools have been established in New York, Chicago, Baltimore, Cincinnati, St. Louis, New Orleans, and Boston. With the single exception of the Johns Hopkins University, all occupy modified old buildings, while this new building is especially adapted from a personal knowledge of the requirements acquired in the old, long-established, and largely endowed institutions of Europe, and arranged by the architects, Messrs. Baker & Dallett. The special features of this new structure are, first, that it has been built to meet the requirements of combining in one institution all of the peculiar advantages to be derived from those hospitals which are devoted to the treatment of a single class of diseases, known as special hospitals; second, the building is arranged to facilitate carrying out the essential character of practical teaching, in which pupils who are practitioners of medicine may be brought in classes, which are always limited in number, into direct contact with the patients. The building is constructed of brick and terra-cotta. The system of heating is by indirect radiation. Incased steam-coils are placed in the cellar, and there heat the pure air brought in by conduits. Other conduits conduct the heated air to the rooms and hallways. Ventilation is accomplished by substratum suction. The exit registers are placed in the walls near the floors, and in proper relation to the position of the hot-air registers. The impure air is carried down to the air-tight ducts under the cellar floor, and passes out above the roof through the high brick stack. In the centre of this stack is a cast-iron pipe, through which passes the gaseous products of combustion from the engine-room. The constant heat in this iron pipe maintains an upward current of air around it inside of the brick stack. This system is arranged to permit the addition, at trifling expense, of an electrical or steam blower, should this be found necessary. All the corners in the building are rounded, to prevent the accumulation of dust and to facilitate thorough cleansing. The elevator shaft, iron stairs, and all toilet-rooms are placed in a practically detached building, which greatly enhances the sanitary condition. City gas has been introduced throughout, but it is contemplated introducing an electric-light plant as soon as funds can be obtained. Varnished natural wood is used throughout the interior, paint being used on the exterior only. The future success of this institution, which is the only one of its kind in Pennsylvania, depends entirely upon the financial support given to it by generous-hearted citizens. It is a matter of experience that charitable and educational institutions are successful in proportion to their endowments. None are self-supporting. The higher medical education of the physician affects the entire community, each and all being subject to illness and accident, each and all desiring above all things a speedy recovery of health. This is materially aided by the Philadelphia Polyclinic, which is the only post-graduate medical college and hospital in Pennsylvania. The endowment of scholarships will permit the awarding of the unique facilities of The Polyclinic to deserving physicians of limited means, as, for example, medical missionaries, or the extending similar privileges to the medical

staff of the army and navy. The endowment of departments will provide the elaborate and often expensive apparatus required by all. The endowment of free beds increases the charitable work.

— The proceedings of the twenty-third annual meeting of the Kansas Academy of Science, held at Lawrence, Nov. 5, 6, and 7, were as follows: Wednesday at 5 P.M. business meeting at the Eldridge House, at 8 P.M. public lecture in Snow Hall by the retiring president, Professor G. H. Failyer; Thursday at 9 A.M. and 3 P.M. meetings for the reading of papers in Snow Hall, at 8 P.M. a reception to visiting members, tendered by the University Science Club; Friday at 9 A.M. and 3 P.M. meetings for the reading of papers, at 8 P.M. an exhibition of lantern and microscopic slides in the University Chapel. The following papers were read, some being by title only: "Observations on the Nutation of Sunflowers," and "Germination of Indian-Corn after Immersion in Water of Different Temperatures," by W. A. Kellerman; "Periodicity in Plants," and "Additions to the Flora of Kansas," by B. B. Smyth; "Plants of the Colorado Boundary," and "Notes on Southern Kansas Plants," by M. A. Carlton; "Equation of the Mean Monthly 21-Year Temperature Curve of Lawrence, Kan.," by E. C. Murphy; "Annual Precipitation of Rain and Snow at Manhattan, Kan., for the Past Thirty-two Years (Chart)," and "Mean Hourly Velocity of Wind at Manhattan, Kan. (Chart)," by C. M. Breese; "An Electrical Hygrometer," by L. I. Blake; "On the Relative Sweetness of the Different Series of Alcohols," by E. E. Slosson; "The Selective Power of the Sense of Taste," by E. H. S. Bailey; "The Sugars of Watermelons," by J. T. Willard; "Notes on Sugar Beets," by G. H. Failyer and J. T. Willard; "Some Notes on Kansas Meteorites," by F. H. Snow; "Notes on Kansas Salt Marshes," by Robert Hay; "Evidences of Prehistoric Man in Labette County, Kan.," by W. S. Hill; "Notes on Some Fossils of Lincoln County, Kan.," by D. S. Kelley; "A Comparison of Preservative Fluids for Museum Use," by V. L. Kellogg and E. E. Slosson; "Notes on Summer Birds of Estes Park, Colorado," by V. L. Kellogg; "On the Skull of *Discosaurus*," by S. W. Williston; "The Civilization of the Mound-Builders," by H. C. Fellow; "Evolution of the Human Face," by A. H. Thompson; "Equal and Unequal Taxation," by J. H. Carruth; "On the Valuation of Mustard from an Estimation of its Sulphuretted Oil," by L. E. Sayre; "Notes on Kansas Minerals," by G. H. Failyer; "Analysis of 'Feather Alum' from Colorado," by E. H. S. Bailey; "On the Most Economic Process for the Manufacture of Iodoform," by S. R. Boyce; "A New Siphoning Extraction Apparatus," by G. H. Failyer and J. T. Willard; "Radiation of Heat from Foliage," by A. G. Mayer; "A New Fire-Screen," and "Notes on the Thermal Resistance of Fire-Screens," by T. H. Dinsmore; "First Addition to the List of Kansas *Peronos Peraceæ*," by W. T. Swingle; "Preliminary Notice of Some Kansas Rolling Plants," by W. T. Swingle and D. G. Fairchild; "Harmonic Forms," by B. B. Smyth; "On Certain Generic Characters of *Tachinida*," by S. W. Williston; "The Flora of Cherokee County, Tex.," by Mrs. A. L. Slosson; "Evolution in Leaves," by Mrs. W. A. Kellerman; "Notes on the Grasses found in the Vicinity of Manhattan," by W. A. Kellerman and Bessie Little; "Note of the Precision of the Solar Attachment," by F. O. Marvin; "Preparation for Scientific Work," by T. H. Dinsmore; "Structure of the Kansas Chalk," by S. W. Williston; "Notes on *Sorghum Smuts*," by W. A. Kellerman and W. T. Swingle; "Notes on the Distribution and Ravages of the Hackberry Knot," by W. A. Kellerman; "Methods of Collecting, Cleaning, and Mounting Diatoms," by Gertrude Crotty; "The Union of *Cuscuta Glomerata* with its Host," by W. C. Stevens; "On the Best Gun for Collecting Naturalist," by J. J. Graham; "Note on the Occurrence of Mammoth Remains in Franklin County, Kan.," by O. C. Charlton; "On the Action of the Pasteur Filter on a Solution containing Bacteria," by L. E. Sayre and V. L. Kellogg; "Differentials of Higher Orders than the First," by E. Miller; "Certain Curves and Surfaces derived from Surfaces of the Second Degree," by H. B. Newson; "Camp of Prehistoric People found near Wichita, Kan.," by J. R. Mead; "Experiments in 1890 for the Artificial Dissemination of the Chinch-Bug Disease," by F. H. Snow; "Note on an Insect found in Flaxseed," by D. S. Kelley.